REMARKS / ARGUMENTS

Introduction

Applicant and applicant's attorney express appreciation to the Examiner for the courtesies extended during the recent interview held on October 12, 2005. This response includes the substance of the Interview and suggestions by the Examiner. Claim 8 has been previously cancelled and claims 1-7 and 9-39 are pending in view of the amendments made herein. For the convenience of the Examiner, the issues are discussed in the order raised in the Office Action mailed September 20, 2005. Reconsideration and allowance for the above-identified application are now respectfully requested.

Claim Rejections Under 35 USC § 103

The Office Action rejected claims 1-7, 9-22, and 28-39 under 35 U.S.C. § 103(a) as being unpatentable over *Rollins* (WO 95/00906) and *Major* (U.S. Pat. No. 5,157,663) in view of *Anderson* (U.S. Pat. No. 6,047,356).

As the Examiner is aware, a *prima facie* case of obviousness requires that there must first be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success and third, the prior art reference(s) must teach or suggest all the claim limitations. *See* MPEP § 2143. The following discussion illustrates that the references cited in the Office Action fail to establish a *prima facie* case of obviousness.

Claim 1, for example, has been amended as discussed at the interview. Claim 1 requires that the first server have a mass storage device and that the second server also have a mass storage device. In claim 1, the first server receives a write request and then issues a write operation request to the second server. Claim 1 then requires determining that the first server has write access to both the first mass storage device and the second mass storage device by performing a policing protocol in response to the write operation request. Once it is determined that the first server has write access to the first and second mass storage devices, claim 1 then executes the write request at the first server. The write request is also executed at the second server using a mirror engine of the second server.

Rollins, in contrast, does not teach the limitations of claim 1 as alleged in the Office Action. Figure 2 of *Rollins*, for example, illustrates that each server is directly connected to the storage devices through connecting means 241. *Rollins* goes into some detail regarding this arrangement and teaches for example, that mass storage system 113 can be selectively connected by connection means 241 to either computer 111 or computer 121 or both. *See* page 14, lines 3-6. The connection means 241 can be two-channel switches, which electronically connect all the interface signals from a mass storage system to two computers. *See* page 15, lines 4-7. The connecting means 241 in *Rollins* teaches that each of the computers 111 and 121 can be directly connected to the mass storage systems 113 and 122.

Claim 1, in contrast, does not require a connecting means. The first mass storage device is not directly connected to the second server and cannot be directly connected to the second server. The first server, for example, issues a write operation request to determine that it has write access. The execution of the write request, however, is performed <u>through</u> a mirror engine of the second server, while *Rollins* teaches instead that a connection is formed between the first server and the mass storage device to perform the write request.

In other words, *Rollins* teaches a connecting means 241 that enables the mass storage systems 113 and 122 to each be connected to the computers 111 and 121. As a result, *Rollins* does not teach or suggest the requirement of claim 1 in issuing a write request and then executing the write request through the mirror engine of the second server. The first server is not connected directly to the second mass storage device whereas the connecting means taught by *Rollins* connects each computer to the mass storage systems as illustrated in Figure 2 of *Rollins*.

The Office Action further combines the teachings of *Rollins* with the teachings of *Major*. The *prima facie* case of obviousness requires that there be some suggestion or motivation to combine references. In this case, however, no such motivation is present as *Rollins* expressly teaches away from *Major*. The Description of the Related Art of *Rollins* explicitly distinguishes *Major* and states that "Figure 1 illustrates the hardware configuration for a fault-tolerant computer system 100, such as described in *Major*." *See* page 3, lines 8-10. *Rollins* concludes that *Major* "is a very time consuming and resource-intensive operation." *See* page 9, lines 1-3. *Rollins* further states that "the resource intensiveness of the recovery operation can cause very substantial performance degradation." *See* page 9, lines 11-13. Because *Rollins* explicitly

09/892,161

teaches away from *Major*, there is no motivation to combine these references and a *prima facie* case of obviousness is therefore not established.

As further discussed at the interview, *Major* teaches a method and apparatus that attempts to convert asynchronous events into a sequential stream of input data. To achieve this, *Major* teaches that both the primary server and the secondary server have event and request queues. When the primary server receives data or an event, it is converted into a message and send to the secondary server. *See* col. 4, lines 45-50. As a result, each of the primary server and the secondary has the same event in separate queues. *Major* teaches the use of queues "to remove the time dependency from the system so that all asynchronous events are converted into a synchronous string of event messages." *See* col. 4, lines 55-60. The queues are then processed separately by the primary and secondary servers.

Claim 1, as discussed at the interview, does not include the use of any queues nor does claim 1 require the conversion of a write request into a message. Rather, the first server issues a write operation request to the second server. A policing protocol is then performed to determine that the first server has write access to both the first mass storage device and to the second mass storage device. The write request is executed at the second mass storage device using a mirror engine of the second server. The I/O driver of the second server does not process the write request.

In *Major*, the primary server does not issue a write request and no policing protocol is performed to ensure that the primary server has write access to the primary mass storage and the secondary mass storage as required by claim 1. Rather, *Major* only sends an event formatted as a message to the secondary server. The secondary server places the received event in an event queue. *Major* therefore teaches that only the secondary server has write access to the secondary mass storage event and that the write access is controlled using the event queues.

Figure 4B of *Major*, for example, illustrates the use of event queues more clearly. The left side of Figure 4B illustrates that the primary server has received an event and then built the event into a message that is given to the secondary server. Meanwhile, as illustrated on the right side of Figure 4B, the secondary server is waiting for an event. Once the event is accepted by the secondary server, the primary server places the event in the primary OS event queue 58 and the secondary server places the event in the secondary OS event queue 63. The secondary event

queue 63 is not executed or written by the primary server whereas claim 1 requires that the first server have write access to the second mass storage device through the second mirror engine.

Because *Rollins* and *Major* fail to teach the limitations identified by the Examiner in the Office Action, Applicants do not address *Anderson* at this time. Applicant notes, however, that *Anderson* is directed generally to caching and that caching is substantially different from mirroring data.

For at least the reasons discussed above, *Rollins*, *Major*, and *Anderson* alone or in combination fail to teach or suggest all of the limitations of claim 1. As a result, claim 1 is in condition for allowance. Claims 2-7, which depend from claim 1, are also in condition for allowance for at least the same reasons.

Independent claim 9 includes similar limitations. Claim 9 requires, for example, that the first mass storage device is connected with the first server and that the second mass storage device is connected with the second server. This is one of the reasons, among others, that claim 9 overcomes *Rollins* in that *Rollins* teaches the connection means to connect the storage means to both computers.

Claim 9 also requires issuing a write operation request to the second server and determining that the first server has write access to the virtual shared storage node by performing a policing protocol. As described above, *Major* teaches the use of messages and event queues. In *Major*, the primary server does not issue a write request and no determination is made to ensure that the primary server has write access to the first and second storage devices because in *Major*, the secondary server executes the messages in the event queue and no access to the secondary storage is provided to the primary server.

For at least these reasons set forth above and as discussed at the interview, claim 9 overcomes the cited art and is in condition for allowance. The dependent claim 10-15 overcome the cited art for at least the same reasons.

The independent claims 16, 20, and 28 have been similarly amended and overcome the art for at least the same reasons. Claims depending from one of claims 16, 20, and 28, namely claims 17-19, 21-27, and 29-39, also overcome the art for at least the same reasons.

Claims 23-27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Rollins*, *Major*, and *Anderson* in view of *Kenley* (U.S. Patent No. 5,276,867). Because claims 23-27
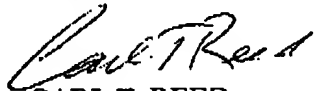
depend from claim 20, which is allowable for at least the reasons discussed above, claims 23-27 overcome *Rollins, Major, Anderson* and *Kenley* and are in condition for allowance.

Conclusion

In view of the foregoing, Applicants respectfully submit that claims 1-7 and 8-39 are in condition for allowance. In the event that the Examiner finds remaining impediments to a prompt allowance of this application that may be clarified through a telephone interview, the Examiner is requested to contact the undersigned attorney.

Dated this 31st day of October, 2005.

Respectfully submitted,

CARL T. REED
Attorney for Applicant
Registration No. 45,454
Customer No. 022913
Telephone No. (801) 533-9800

DAJ
DFW00000015665V001.doc

18 of 18   09/892.161